United States Patent [19]

Redford

[11] **3,713,495**

[45] **Jan. 30, 1973**

[54] **AUTOMATIC DISK HARROW HINGE LOCKING DEVICE**

[75] Inventor: **Robert L. Redford,** Westmont, Ill.

[73] Assignee: **International Harvester Company,** Chicago, Ill.

[22] Filed: **Sept. 10, 1970**

[21] Appl. No.: **71,036**

[52] **U.S. Cl.** **172/456,** 16/146, 172/568, 287/99

[51] **Int. Cl.**.....**A01b 65/02,** E05d 11/10

[58] **Field of Search**.....172/311, 456, 568; 16/145–147; 244/49; 49/199; 182/22–33, 104, 158, 163; 280/411–413; 287/99

[56] **References Cited**

UNITED STATES PATENTS

3,123,153	3/1964	Morkoski	172/568
3,506,073	4/1970	Walberg	172/568
1,404,544	1/1922	Rettig	172/456
1,672,038	6/1928	Reimer	280/411 R
1,033,696	7/1912	Hilliard	280/411 R
203,561	5/1878	Sherwood	182/23
1,715,590	6/1929	Burhenne	16/146
1,308,938	7/1919	Donovan	280/411 R

FOREIGN PATENTS OR APPLICATIONS

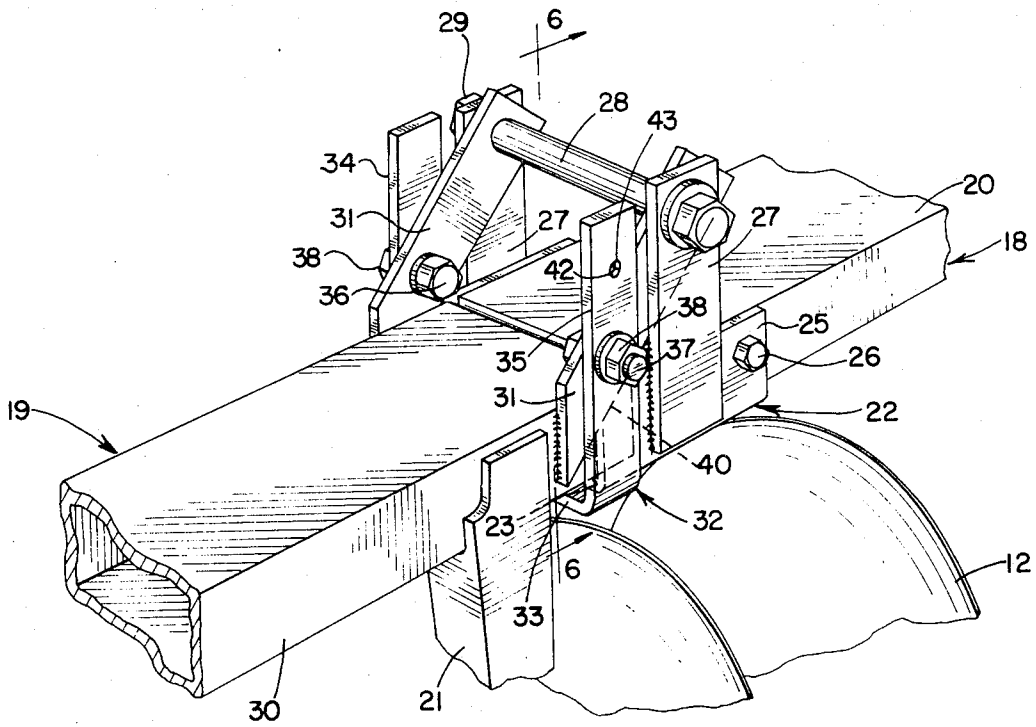
639,513	11/1936	Germany	287/99
211,355	4/1956	Australia	16/142

Primary Examiner—Robert E. Pulfrey
Assistant Examiner—C. W. Hanor
Attorney—Floyd B. Harman

[57] **ABSTRACT**

In a folding wing disk harrow wherein the disk carrying wing beam is hinged to the main beam for pivoting in a vertical plane, the main beam has an extension underlapping and supporting the adjacent end of the wing beam and means are provided for locking the wing beam in its operating position in a horizontal alignment with the main beam including yieldable means for biasing the locking means to its locking position.

1 Claim, 6 Drawing Figures



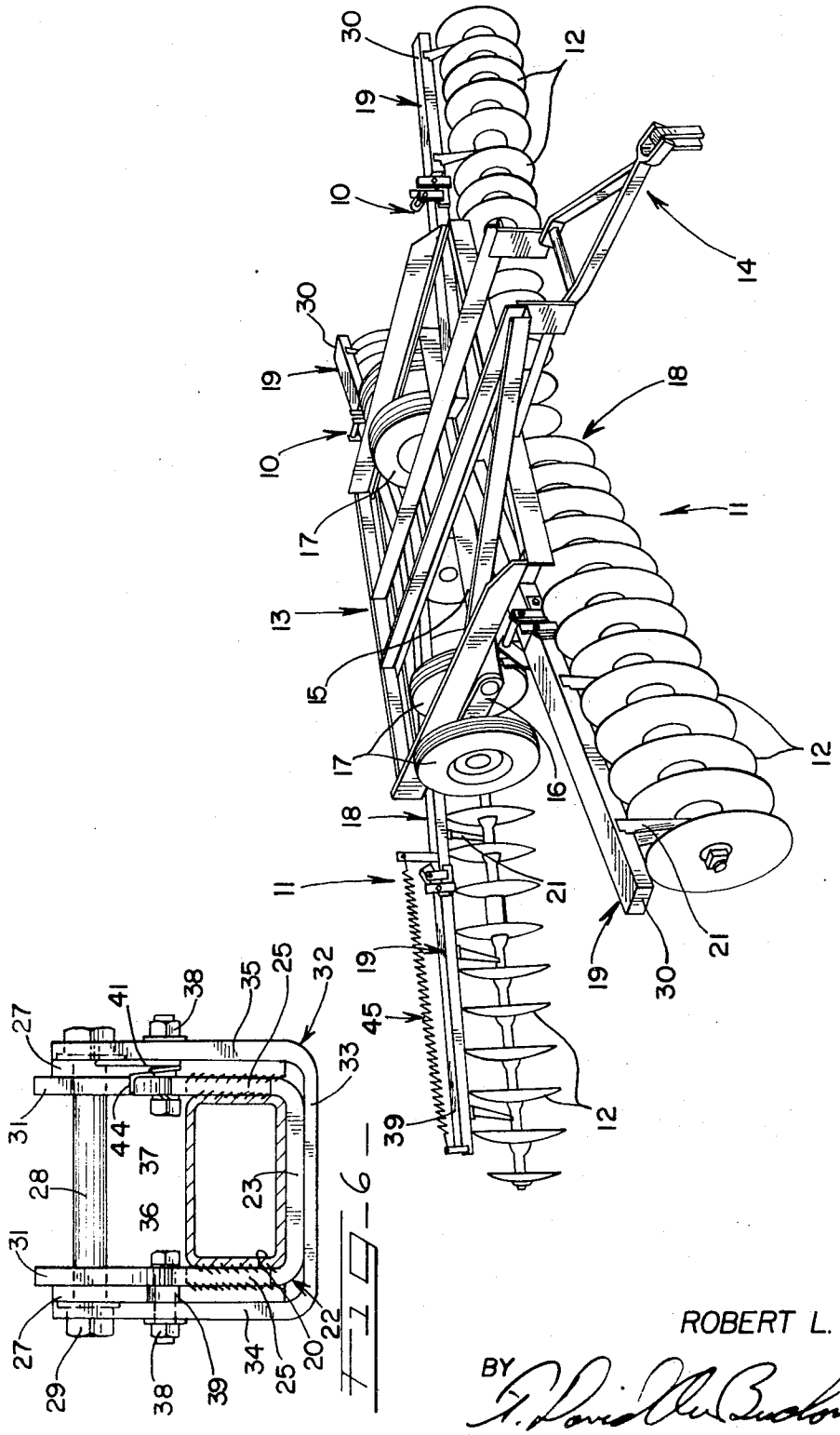


FIG. 1

FIG. 6

INVENTOR
ROBERT L. REDFORD

BY T. David McCracken ATT'Y.

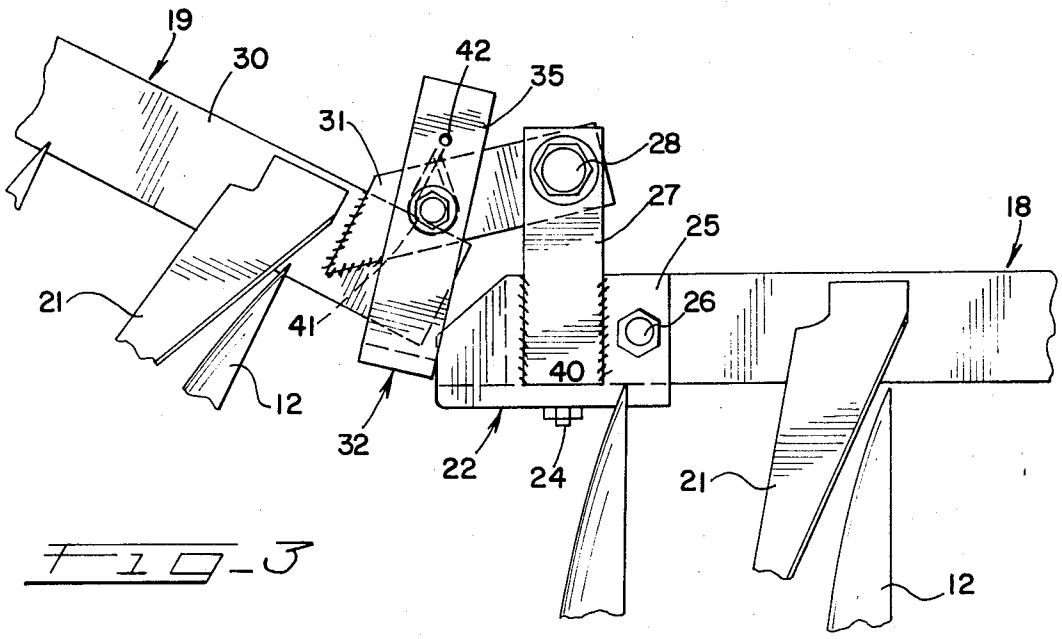


FIG. 3

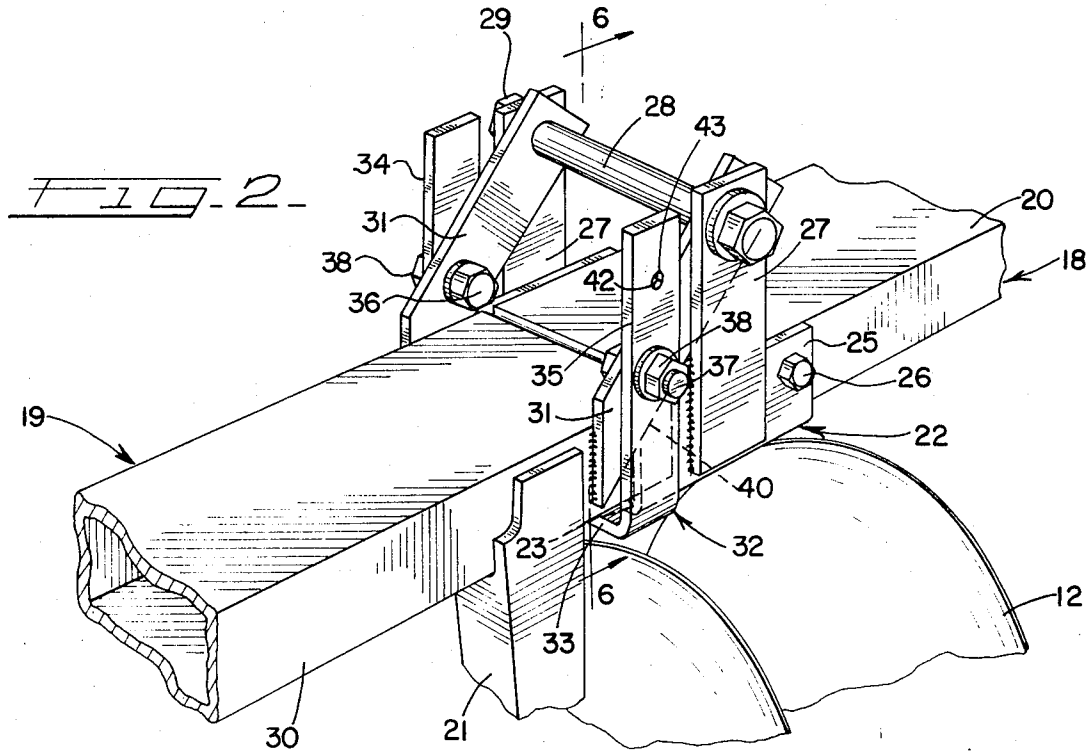
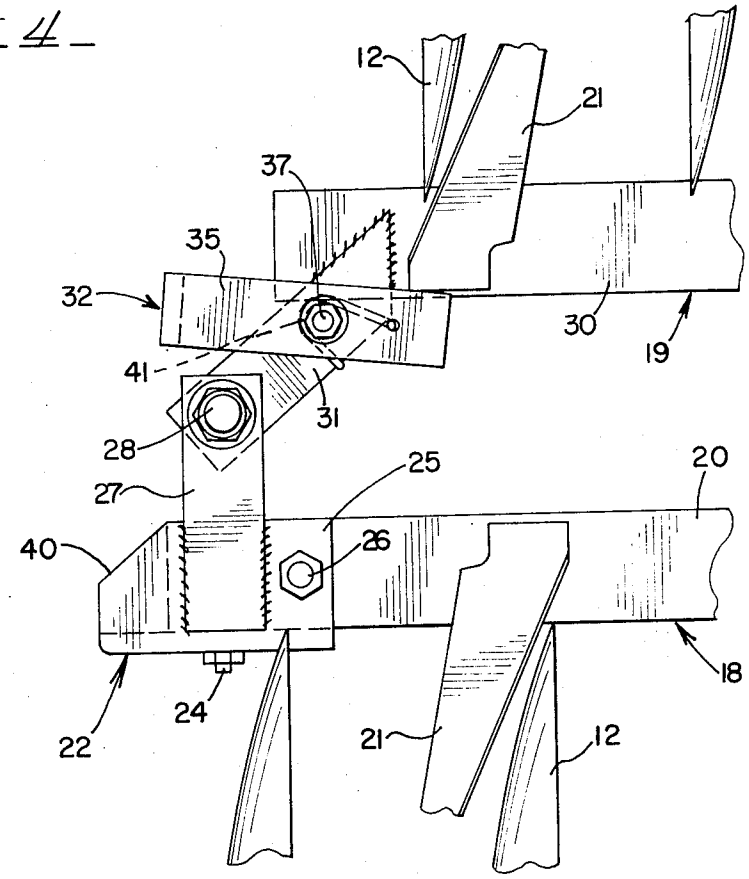


FIG. 2

INVENTOR
ROBERT L. REDFORD

BY T. Davis McBroom ATT'Y.

FIG-4-



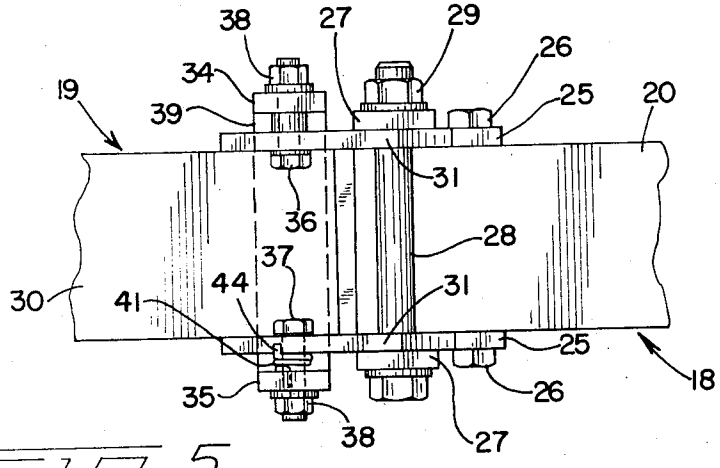


FIG-5-

INVENTOR
ROBERT L. REDFORD

BY F. David McCutchen ATT'Y.

AUTOMATIC DISK HARROW HINGE LOCKING DEVICE

BACKGROUND OF THE INVENTION

This invention relates to folding wing implements and particularly to novel means for attaching the wing section to the outer end of the main section.

In implements such as disk harrows, increased width to meet the demands of modern farming practices is usually achieved by hinging to the basic harrow disk gang sections, extension wings which can be folded upon the main sections to reduce the overall width so the implement can be transported over roads and through gates. It is important that each main gang section and its extension or wing section operate as a unit with the disks in axial alignment for uniform disk penetration, and this requires a rugged connection between the sections which not only accommodates the folding of the wing to its inoperative position substantially within the lateral confines of the basic implement but which securely locks each wing section in its operating position in alignment with the main section.

Prior constructions have been unsatisfactory in that the operator has been required to carry wrenches and the like into the field to attach and remove the bolts or other fastening means by which the wing section was secured to the main implement section, and inasmuch as tandem disk harrows utilize four basic or main gang sections, each of which has a wing extension, considerable time and effort have been expended in folding and unfolding the wings. Therefore, an object of the present invention is the provision of simple and efficient means for hingedly attaching a wing extension to the main tool-carrying section of an implement.

Another object of the invention is the provision, in an implement such as a disk harrow having foldable wing sections, of simple and economical means for locking the wing sections to the main sections when the wings are returned from the folded inoperative position, to their aligned operating position.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, with parts removed, of a folding wing tandem disk harrow incorporating the features of this invention;

FIG. 2 is an enlarged detail in perspective illustrating the means by which one of the wing sections is connected to a main implement section;

FIG. 3 is a detail in side elevation of one of the wing gang sections released from the associated main section and beginning its arc of swinging movement about the axis of its pivotal connection to the main gang section;

FIG. 4 is a view similar to FIG. 3 after the wing section has swung 180° to its fully folded inoperative position above and generally parallel to the main section;

FIG. 5 is a plan view of the structure shown in FIG. 2; and

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The implement shown in FIG. 1 is a wheel controlled tandem disk harrow comprising front and rear relatively angled left and right hand disk gangs 10 and 11, respectively, from which are suspended disks 12, the gangs being supported by a generally rectangular frame 13 having a forwardly extending hitch structure 14 adapted for connection to a tractor. It may be understood that disk gangs 10 and 11 are mounted on the supporting frame 13 by conventional means, not shown, accommodating angular adjustment of the gangs, and that the gangs are substantial duplicates with the disks 12 of the front gangs facing outwardly while those of the rear gangs face inwardly in a manner well known in the art.

The implement is supported and raised to a transport position by the provision of a transverse rock shaft 15 mounted on the frame and having at its ends crank arms 16 upon each of which is mounted a pair of wheels 17. Shaft 15 is rockable in well known manner by suitable power transmission means such as a hydraulic cylinder, not shown, receiving fluid under pressure from a source on the tractor by which the implement is propelled. Rocking the shaft 15 to swing the wheel carrying arms 16 vertically raises and lowers the implement.

Each of the gangs 10 and 11 has a main section 18 and a wing section 19, and main section 18 comprises a horizontal beam 20, rectangular in cross-section, from which disks 12 are suspended by hangers 21 as indicated in FIG. 1. The outer end of beam 20 is seated in a channel shaped member 22 a portion of which projects from the end of beam 20, member 22 having a transverse portion 23 attached to the beam by a bolt 24, and sides 25 secured to the beam by bolts 26. A pair of upstanding brackets 27 are affixed, as by welding, to sides 25 of channel member 22 and carry at their upper ends a hinge pin 28 held against axial displacement by a nut 29.

Outer disk gang section 19 comprises a rectangular beam 30 in horizontal alignment with main beam 20 in the operating position of FIG. 1 and from which the disks are also suspended by hangers 21. The inner end of wing beam 30 is seated in overlapping relation to the projecting bottom portion 23 of channel member 22 between the sides 25 thereof, as indicated in FIGS. 2 and 6, and has affixed, as by welding, to opposite sides thereof upwardly extending and inwardly angled lugs 31, the upper ends of which are mounted on hinge pin 28 to accommodate pivoting of wing section 19 in a vertical plane about the axis of the hinge from the extended, operating position of FIGS. 1 and 2 to the folded inoperative position of FIG. 4 generally parallel to main section 18.

Wing section 19 for each of the gangs 10 and 11 is locked in its operating position to the main section 18 by the provision of a U-shaped rockable member 32 having a transverse bight portion 33 and upwardly directed arms 34 and 35 pivotally mounted medially of their ends on the respective lugs 31 by pivot bolts 36 and 37 and removably secured by nuts 38.

A spacer 39 is provided on bolt 36 between arm 34 of rockable member 32 and the adjacent lug 31, and it will be observed in FIG. 2 that in the operating position of wing section 19 the angled lower edges of lugs 31 are engageable with a beveled upper edge 40, shown clearly in FIGS. 3 and 4 formed at the outer projecting ends of the sides 25 of channel member 22 to act as a stop or abutting means limiting downward swinging of wing beam 30 relative to main beam 20.

The bight portion 33 of rockable member 32 in the operating position of wing section 19, as clearly shown in FIGS. 2 and 6, is in underlapping relation to the transverse portion 23 of channel member 22 to lock the main and wing sections together and is automatically rocked to its locked position by the provision of a torsion spring 41 coiled around bolt 37 between lug 31 and arm 35. One end 42 of spring 41 is anchored in an opening 43 provided in the portion of arm 35 projecting above bolt 37, and its other end 44 bears against the upper edge of the adjacent lug 31 to yieldably bias member 32 to rock in a counterclockwise direction as viewed, for example, in FIG. 3.

Member 32 is rocked clockwise about the axis of pivot bolts 36 and 37 against the bias of spring 41 to release it from locking engagement with channel member 22, and in an implement of the size and type shown wherein the wing sections 19 are relatively heavy, it is customary to provide helper springs such as indicated at 45 in FIG. 1 for the right hand rear disk gang 11. Such helper springs function in a manner well known in the art to facilitate manual folding and unfolding of the wing sections.

It is believed that the construction and operation of the novel implement wing locking mechanism of this invention will be clearly understood from the foregoing description. It should also be understood that, upon returning the wing section from its folded inoperative to its aligned operating position the bias of spring 41 urges it into its locking position.

What is claimed is:

1. In a folding wing implement including a main beam and wing beam, an upstanding bracket affixed to said main beam, and upwardly extending lug affixed to said wing beam, hinge means comprising a pivot pin interconnecting the upper ends of said bracket and said lug to accommodate pivoting of the wing beam from an extended operating position in horizontal alignment with the main beam to a folded inoperative position relative thereto, abutting means on said main and wing beams, said respective abutting means engaging when the wing beam is in the extended operative position to prevent further downward pivotal movement of the wing beam relative to the main beam, releasable means for locking the wing beam in its extended operating position comprising, a rockable member pivotally connected to said wing beam having a lower horizontal portion in underlapping engagement with said main beam when said wing beam is in the operating position, and an upright lever portion for rocking said rockable member out of underlapping engagement with said main beam, and yieldable means comprising a spring operatively connected between said upwardly extending lug and said upright lever portion for biasing said rockable member into underlapping engagement with said main frame, said upstanding bracket comprises a pair of brackets affixed to opposite sides of said main frame, and said upwardly extending lug comprises a pair of lugs affixed to opposite sides of said wing beam and wherein said rockable member is a U-shaped member having its bite portion underlapping said main beam in said operating position of the wing beam and including upperly extending arms and pivot means connecting said upperly extending arms to said pair of lugs.

* * * * *